esse·ti
TELECOMUNICAZIONI

Certificato n. 9110.ESTI
UNI EN ISO 9001:2008

GSM500

User's manual

03/11/2014

CE

Thanks for choosing an Esse-ti product

This product has been especially designed for easy operation. It has been manufactured with perfect workmanship using suitable materials for long-lasting performance.
All Esse-ti products are subjected to extensive reliability and operational testing in our laboratories in order to provide total guarantee for the user.

The User shall be responsible for defects arising from the use of the product. Esse-ti shall only be responsible for defects according to and within the limitations set by the Presidential Decree dated 24/05/1988 no. 224 (fulfilling the EEC directive no. 85/374 on the harmonization of statutory and administrative regulations of the Member States on the liability for damages arising from defective products under art. 15 of Law no. 183 of 16 April 1987).

Esse-ti reserves the right to modify the product characteristics at any time without prior notice.

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GENERAL INSTALLATION INSTRUCTIONS

GENERAL NOTES

Carefully read the notes contained in this section as they provide important information on safe correct installation, use and maintenance of the product.

- The product must be EXCLUSIVELY used for the purpose it was designed for. Esse-ti shall not be responsible for damages arising from improper use.
- The product has been designed in compliance with the regulations in force and must be installed in systems that comply with the provisions of law.
- Always disconnect power supply before performing internal or external operations on the product (cleaning, maintenance, etc.).
- Always refer to an authorized service centre for repair.
- The device must be installed in a ventilated place, making sure that the ventilation slots are never obstructed.
- Do not install the product in environments with risk of explosion.
- Make sure that the product has been installed as required.
- Do not introduce objects, liquids or powders inside the product. Do not use sprays inside the product.
- Packing components (such as plastic bags, foam polystyrene, etc.) must be kept out of the reach of children because potentially dangerous.

MAKING THE INSTALLATION

Internal telephone installations must be carried out by specialised personnel.

The installation and connection of telephone terminals to the telecommunications network that do not comply with the regulations in force is not permitted.

DESCRIPTION

GSM500

GSM500 is a device that, connected to a fixed telephone or to the PSTN input terminals of a PABX or autodialer, allows you to make and receive calls over the GSM network. For correct operation, a normal GSM SIM card is required.

GSM500 GC

The **GSM500 GC** gateway comes with built-in backup batteries.

GSM500 R2R

The **GSM500 R2R** gateway comes with built-in backup batteries and a relay output which can be activated either locally or remotely via SMS.

GSM500 DATA

The **GSM500 DATA** gateway comes with female DB-9 connector for direct connection to the GSM module.

GSM500 GC DATA

The **GSM500 GC DATA** gateway comes with built-in backup batteries and female DB-9 connector for direct connection to the GSM module.

GSM500.net

The **GSM500.net** gateway comes with built-in backup batteries and female DB-9 connector for data transmission (through standard RS-232/RS-485/CAN-bus) and SMS forwarding (through standard RS-232/CAN-bus). For correct operation, a GSM (voice + data) SIM card is required (GPRS data connection).

Features

- Local programming via DTMF tones;
- Remote programming via SMS;
- Display of caller identification;
- Country setting;
- CLIP / CLIR;
- Roaming setting;
- Low-battery check
  (only available on models: GC, R2R and .net);
- Power failure control
  (only available on models: R2R and .net);
- Low-battery, power failure/restore notification via SMS;
- Measurement of GSM signal level;
- Automatic converter of selected telephone number;
- Receiver and transmitter gain adjustment;
- Remote reboot function;
- Data transmission through standard RS-232, RS-485 and CAN-bus
  (only available on models: .net)
- Incoming text messages transmission towards devices wired in the DB-9 connector under RS-232 standard
  (only available on models: .net);
- Text messages transmission by devices wired into the DB-9 connector under RS-232 or CAN-bus standard
  (only available on models: .net);
- GSM signal indicator LED;
- Status indicator LED;
- Line status indicator LED / Data transmission indicator LED (only available on models: .net);
- Power supply status indicator LED;
- Dual Band GSM module;
- 2W transmission power;

- 12Vdc power supply input;
- 230Vac external adapter input;
- Female DB-9 connector
  (only available on models: DATA and .net);
- Relay output
  (only available on models: R2R);
- External antenna
  (cable length = 2m);
- External adapter
  (230Vac 50Hz input; 12Vdc 1A output; CE mark; only available on models: GC, R2R and .net).

LED

The GSM500 is equipped with 4 outer LEDs.
LEDs flashing is described at chapter "SIGNALS" (see page 59).

Green LED: GSM signal indicator LED

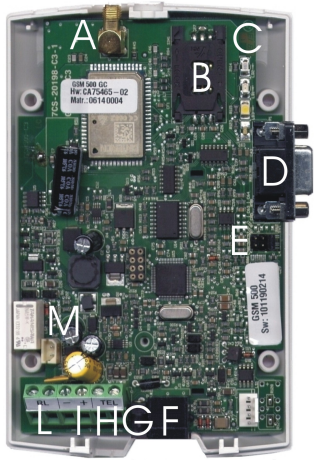
Red LED: Status indicator LED

White LED: Line status indicator LED / Data transmission indicator LED (only available on models: .net)

Blue LED: Power supply status indicator LED

INSTALLATION

- Remove the cover by pressing the upper side.



A ANTENNA cable connector
B SIM CARD housing with front panel
C LED indicating signal strength (green), LED indicating device operation status (red), LED indicating line status / data transmission (white) and LED indicating power supply status (blue)
D Female DB-9 connector (DATA and .net models only)
E Jumper (.net model only)
F Telephone line output (RJ11 connector) for telephone set connection or PABX analogue line connection
G 230Vac external adapter input
H Telephone line output (terminal block) for connection of autodialer/PABX analogue line
I 12Vdc power supply terminal block
L Relay terminal block (R2R model only)
M Backup battery connector (GC, R2R and .net models only)

Inserting the SIM card

Before inserting or replacing the SIM card, always make sure that the gateway has been disconnected from the mains and that no electrostatic discharge is present in order to avoid damaging it.

Take all necessary measures to avoid electrostatic discharge.

- Shift the SIM card housing cover downward until it unblocks and lift it.
- Carefully slide the SIM card into its housing cover.
- Lower the SIM card housing cover and shift it upward until it blocks.

WARNING
The SIM card PIN must be DISABLED. If the PIN is enabled, it must be disabled through a mobile phone.

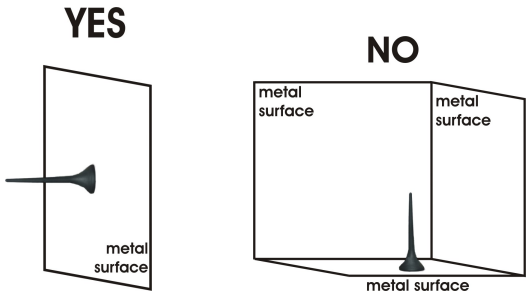
Inserting the antenna

- Screw the antenna cable in to the connector on the top of the module.

WARNING
NEVER connect the GSM500 gateway without having previously installed the antenna. The gateway may get damaged.

WARNING
Do not install the product near other electric or electronic devices that were not especially designed to be used with it. They could be subjected to RF interference from the module.

- Position the antenna with magnetic base so that any metal surfaces do not block the signal.



Connection to the telephone line

- Connect the GSM500 to a standard telephone or to the PSTN input terminals of a PABX or autodialer via the RJ-11 connector (F in the picture at page 10);

or

- Connect the GSM500 to a standard telephone or to the PSTN input terminals of a PABX or autodialer using the TEL terminal (H in the picture at page 10).

Connection to the power supply

Power supply via 230Vac external adapter

- Connect the external adapter to the specific input (G in the picture at page 10).
- Connect the backup batteries (if present) to the dedicated input (M in the picture at page 10).
- Close the gateway cover.

or

12Vdc power supply

- Connect the power supply cable to the terminal (I in the picture at page 10) taking care to respect the polarity.
- Connect the backup batteries (if present) to the dedicated input (M in the picture at page 10).
- Close the gateway cover, paying attention to the power supply cable.

WARNING
Backup batteries, if present, may be connected only after GSM500 has been supplied

Note: the max voltage to be supplied to the mains terminal I is 17Vdc.

Note: the min voltage required to supply the GSM500 gateway by the mains terminal I is 10Vdc.

Note: a protection cut-out switch must be installed upstream to interrupt power supply in case of fault.

Turning the GSM500 gateway on

- Power the GSM500.
- Wait 30 seconds after power-up to give time to the GSM500 to register correctly with the GSM network.
- Make sure the red LED (device status) flashes briefly once every 3 seconds as shown in chapter "SIGNALS" (see page 60).

If the red LED flashes quicker and stays lit for a longer time (see page 60), the GSM gateway has not properly registered with the GSM provider:

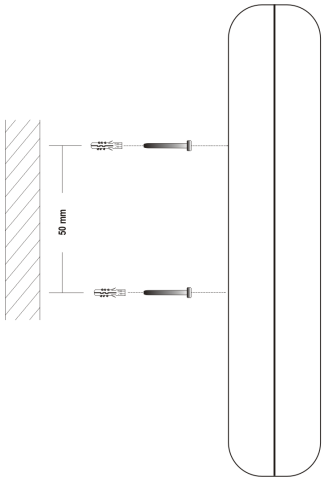
- Disconnect GSM500 and make sure the SIM card is inserted correctly and that the PIN is not locking it.
- See chapter "PROBLEM-DETECTION GUIDE" (page 62).

Gateway mounting operations

- Check the GSM signal strength through the green indicator LED (see chapter "SIGNALS", page 59) and identify an area where the signal is strong enough.

  Note: the signal strength may vary according to the telephone provider.

- Drill two holes with 5 mm diameter on the wall at a distance of 50 mm.
- Insert the 2 wall plugs and screws down until the screws are at a 5 mm distance from the wall.
- Place the GSM500 gateway onto the two screws through the two back slots.



GSM500 installation recommendations

- The GSM500 gateway must be installed in a location where the radio signal allows for using the GSM system.
- It is advisable to leave plenty of space around the gateway for maintenance operations.
- Do not install the GSM500 gateway outdoors, since it lacks protection devices against weather conditions that can damage the gateway (water, humidity, etc.).
- Do not install the GSM500 gateway near electronic (radio or TV sets, Personal Computers, wired radio systems, etc.) or magnetic (credit cards, floppy disks, etc.) devices that could be subjected to RF interference from the module: recommended distance from the antenna is min. 2,5 m.
- Do not install the GSM500 gateway near medical devices. Its operation may cause damage to hearing aids or pacemakers.
- Always make sure that the device operation is permitted in the place of installation (e.g. installation is not allowed in hospitals, airplanes, etc.).

Absorption chart

Power supply	10Vdc	12Vdc	13,8Vdc	10Vdc	12Vdc	13,8Vdc
	(battery not connected)			(battery connected)		
Telephone handset down	30mA	30mA	25mA	40mA	60mA	50mA
Telephone handset up	90mA	80mA	70mA	100mA	105mA	90mA
Conversation	130mA	115mA	110mA	140mA	135mA	130mA
Data transmission	75mA	60mA	55mA	85mA	80mA	75mA

PROGRAMMING VIA TELEPHONE

Allows you to customise the gateway according to your requirements. Programming can be carried out locally via a MF telephone.

You can programme:

- voltage of telephone line;
- use mode;
- inter-digit dialling time;
- country settings (country calling code and international call prefix);
- CLIP/CLIR settings;
- roaming service settings;
- provider's voicemail service deactivation;
- notifications telephone number;
- administrator telephone number ;
- programming-mode password;
- low-battery check;
- power failure control;
- automatic converter of selected telephone number;
- receiver gain adjustment;
- transmitter gain adjustment;
- relay settings.

Note: during programming, the inter-digit dialling time must not exceed 10 seconds. Once 10 seconds has elapsed without digits you will hear the dissuasion tone and you will have to hang up.

Note: at the end of each programming carried out correctly, you will hear a confirmation tone, while an error tone will be heard in case of error. In any case, the dialling tone will follow, after which you can proceed with the programming or make a call.

Note: programming can be carried out even if the signal is absent. After the confirmation or the error tones, the "no signal" tone will follow, after which you can proceed with programming or hang up.

TELEPHONE LINE VOLTAGE

The following programming allows you to modify the voltage in the TEL terminal and in the RJ-11 connector. A higher voltage may be required for the proper functioning of specific devices.

Factory default: higher voltage (52Vdc).

✱✱61✱ X (option) # (confirm)

- Lift the handset and dial: **61*.
- Enter:
  - 0 lower voltage (36Vdc);
  - 1 higher voltage (52Vdc).
- Dial # to confirm.
- After the confirmation tone hang up or enter additional settings.

USE MODE

The GSM500 delivers 4 different use modes which allow to improve performance according to the specific devices being connected. They should be selected in case the connected devices detect the telephone line tones or when echo occurs during conversation.

Factory default: mode1.

Mode 1

Factory default.

- Lift the handset and dial: **21.
- Dial # to confirm.
- After the confirmation tone hang up or enter additional settings.

Mode 2

Use mode recommended for autodialers or other devices effecting tone detection over the line.

- Lift the handset and dial: **22.
- Dial # to confirm.
- After the confirmation tone hang up or enter additional settings.

Mode 3

Use mode recommended to reduce echo occurring during conversation.

- Lift the handset and dial: **23.
- Dial # to confirm.

- After the confirmation tone hang up or enter additional settings.

Mode 4

Use mode recommended to reduce echo in case of connection with devices effecting tone detection over the line.

- Lift the handset and dial: **24.
- Dial # to confirm.
- After the confirmation tone hang up or enter additional settings.

INTER-DIGIT DIALLING TIME

The inter-digit time is the maximum amount of time allowed between digits while dialling a telephone number.

There are 2 ways to make outgoing calls:

- Dial the telephone number and then press # to confirm. The call is sent immediately.
- Dial the telephone number and wait. The call will be sent after the inter-digit time has elapsed.

Factory default: 5 seconds.

- Lift the handset and dial: **8*;
- Dial the inter-digit dialling time:

  0 inter-digit time: 10 seconds;

  1-9 inter-digit time from 1 to 9 seconds.

- Dial # to confirm.

- After the confirmation tone hang up or carry on with other programmings.

COUNTRY SETTINGS

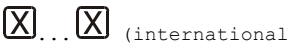
This programming allows defining the country of use of the GSM500, in order to set automatically the device with the proper parameters (if available).

For example the tones of the call change and on the display of a telephone connected to the GSM500 the calling number is shown without the area code.

International call prefix

The international call prefix is the first part of a country's code. For example, the international dialling code for Italy, whose complete code is 0039, is 00.

Factory default: 00.



- Lift the handset and dial: **08*;
- Dial the international call prefix (max. 5 digits).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Country calling code

The country calling code is the second part of a country's code. For example, the country calling code for Italy, whose complete code is 0039, is 39.

Factory default: 39.

(country calling code) (confirm)

- Lift the handset and dial: **09*;
- Dial the country calling code (max. 5 digits).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

CLIP SETTING

Upon an incoming call, if a telephone connected to the GSM500 is provided with a display, it will show the CLI (caller identification). Moreover, on some telephones and some switchboards, it is also possible to display date and time of the call. With this programming you can determine whether to show the date and time of the call in addition to the caller's number.

Factory default: date and time not displayed.

Activation

(day/month/year)

(hh/mm) (confirm)

- Lift the handset and dial: **7*1*.
- Dial the day (two digits), the month (two digits) and the year (two digits).

- Dial *.
- Dial the hour (two digits); dial the minutes (two digits).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Note: if the GSM500 gateway remains off for a long time, it will be necessary to repeat the activation procedure; otherwise the date and time displayed could be incorrect.

Deactivation

- Lift the handset and dial: **7*0.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

CLIR SETTING

Permanent setting

Thanks to this programming you can decide whether to send out your telephone number during outgoing calls.

Factory default: operation based on the service provided by your provider.

- Lift the handset and dial: **6*.

- Enter:
  - 0 operation based on the service provided by your provider;
  - 1 restriction active;
  - 2 restriction not active.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Note: if you choose option 1 your telephone number will not appear on the call recipient's display.

Temporary setting

The following programming allows you to modify the CLIR permanent setting for one call only.

Enabling restriction for a call

Initial situation: CLIR restriction not active.

This programming allows you to activate the CLIR restriction for the immediately subsequent call.

- Lift the handset and dial:**16.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Disabling restriction for one call

Initial situation: CLIR restriction active.

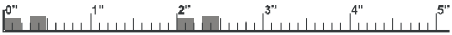
This programming allows you to deactivate the CLIR restriction for the immediately subsequent call.

- Lift the handset and dial:**17.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

ROAMING SETTING

It allows to enable or disable the roaming function of the GSM500 gateway.

When the roaming service is disabled, in case the GSM500 registers with a different provider than the programmed, it is not possible to make or receive any calls. Such a condition is signalled by the following tone sequence:



Factory default: roaming enabled.

Note: such setting is recommended for use under neighbouring-countries areas, in order to avoid the undesired selection of foreign operators.

Enabling roaming service

(confirm)

- Lift the handset and dial: **5*1.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Disabling roaming service

It allows to select a specific SIM's provider by disabling the GSM500's operation with any other provider .

(MCC) (MNC) (confirm)

- Lift the handset and dial: **5*0*.
- Select the specific SIM's provider by dialling the related MCC (Mobile Country Code) and MNC (Mobile Network Code) codes.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

PROVIDER'S VOICEMAIL SERVICE DEACTIVATION

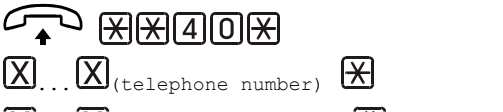
It allows to deactivate the provider's voicemail service (only available on models: R2R and .net).

(confirm)

- Lift the handset and dial: **31.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

SETTING TELEPHONE NUMBER FOR NOTIFICATION SERVICE

It allows to enter the telephone number appointed for notifications via SMS of power failure/restore, low-battery and battery status.



- Lift the handset and dial: **40*.
- Enter the telephone number to which the notification SMS must be sent.
- Dial *.
- Enter again (for confirmation) the telephone number to which the notification SMS must be sent.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Deleting

It allows to delete the telephone number appointed for SMS notifications or warnings.

- Lift the handset and dial: **40.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

SETTING THE ADMINISTRATOR TELEPHONE NUMBER

SMS programming mode may be effected by any mobile phone or other device sending out SMS. After setting the administrator telephone number, programming mode via SMS is only allowed by the administrator's telephone number.

Note: once it has been entered, the administrator number will receive the notification SMS related to the "Automatic converter" service.

Note: for a proper use please enter first the country code and then the administrator number without the first zero (for example: if the administrator number is 07715123456 and the GSM500 is located in England please enter 00447715123456).

**18* X...X (telephone number)

* X...X (telephone number) # (confirm)

- Lift the handset and dial: **18*.
- Enter the administrator telephone number.
- Dial *.
- Enter the administrator telephone number again (for confirmation)
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Deleting

It allows to delete the administrator telephone number.

**18 # (confirm)

- Lift the handset and dial: **18.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

PROGRAMMING PASSWORD

It allows to change the programming password.

Factory default: 0.

Note: make sure the password has been noted down. In case it is lost, please contact the nearest technical service center.

****19*** **XXX** (password) ***** **XXX** (password) **#** (confirm)

- Lift the handset and dial: **19*.
- Enter the new programming password (max. 3 digits).
- Dial *.
- Enter the new password again (for confirmation).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

LOW-BATTERY CHECK

If the low-battery check is enabled, GSM500 checks the battery status every second. When the charge goes below the previously-programmed threshold ensuring the minimum number of operating hours in idle mode, a notification SMS is sent to the programmed telephone number (see "Setting telephone number for notification service"). The device sends out one notification SMS only. A new SMS will be sent out if the charge status rises and goes again below the previously-set threshold.
The SMS text is the following: "*Discharged battery*".
The low-battery check is only available on models: GC, R2R and .net.
The built-in backup batteries ensure 8 operating hours in idle mode and 1 operating hour in conversation mode.
Factory default: disabled.

Enabling

It allows to activate the low-battery check.

Enabling

- Lift the handset and dial: **50.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Disabling

- Lift the handset and dial: **51.
- Dial # to confirm.

- After the confirmation tone hang up or carry on with other programmings.

Programming the minimum value

It allows to set the min. number of operating hours in idle mode. Below this threshold, a notification SMS is sent out.

Factory default: 4 hours.

- Lift the handset and dial: **52*.
- Enter the value (0 ~ 7) according to the table below:

0	1	2	3	4	5	6	7
7h	6h e 30′	6h	5h e 30′	4h	2h e 30′	1h e 30′	1h

- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

POWER FAILURE CONTROL

If the control on power failure is enabled, GSM500 constantly controls the mains power supply. If the power failure lasts longer than the preset time interval, a notification SMS is sent to the programmed telephone number (see "Setting telephone number for notification service").

The SMS text is the following: "*Power failure*".

A new SMS will be sent if the power supply is restored for a time interval equal to the preset threshold.

The SMS text is the following: "*Power restored*".

The power failure control is only available on models: R2R and .net.

Factory default: disabled.

Enabling

It allows to activate the power failure control.

Enabling

- Lift the handset and dial: **81*.
- Enter the minutes of power failure/restore (1 ~ 9).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Disabling

- Lift the handset and dial: **81*0.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

AUTOMATIC CONVERTER OF SELECTED TELEPHONE NUMBER

This service allows to enter up to 5 telephone numbers automatically receiving any outgoing call, regardless of the real telephone numbers dialled out by the telephone or autodialer connected to the GSM500 gateway.

Each preset telephone number is matched with a corresponding telephone number , either by programming and/or automatic learning. When dialing

out the corresponding telephone number , the GSM500 will make a call to the previously-matched telephone number instead of calling the real one. When dialing out a telephone number not associated with any preset number, the call will be automatically forwarded to the first preset telephone number.

Note: to enable the "Automatic converter" service, you simply need to preset one telephone number; to disable this service, all preset telephone numbers must be deleted.

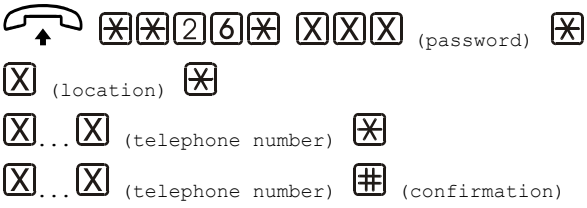
Example:
preset table:

Location	Selected tel. number	Preset tel. number
1	3331234567	0717506065
2	3339876543	0717506066
3	0733434343	0717506067
4	0733445566	0717506068
5	0733778899	0717506069

- when selecting tel. number 3331234567, the GSM500 will make a call to 0717506065;
- when selecting number 3339876543 , the GSM500 will make a call to 0717506066;
- etc;
- when selecting any number not included in the "Selected telephone number" column, GSM500 will send a call to the first telephone number included in the "Preset telephone number" column.

Entering preset numbers

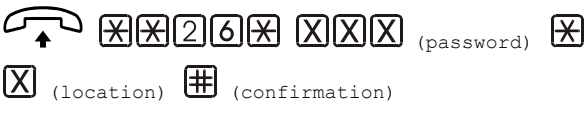
It allows to enter up to 5 telephone numbers receiving any outgoing call sent out by GSM500.



- Lift the handset and dial : **26*.
- Enter the programming password.
- Dial: *.
- Enter the desired telephone number location (from 1 to 5) in the related table.
- Dial *.
- Enter the telephone number to be preset.
- Dial *.
- Enter again the telephone number to be preset.
- Dial # to confirm the entered parameter.
- After the confirmation tone hang up or carry on with other programmings.

Deleting a preset telephone number

It allows to delete a preset telephone number.



- Lift the handset and dial: **26*.
- Enter the programming password.
- Dial *.

- Enter the location of the telephone number to be deleted.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Deleting all preset telephone numbers.

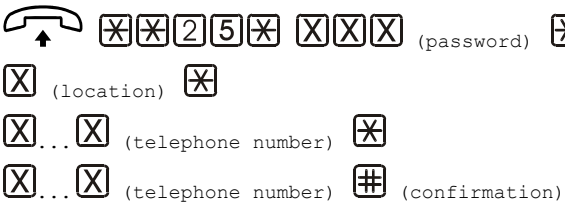
It allows to delete all the preset telephone numbers.

- Lift the handset and dial: **26*.
- Enter the programming password.
- Dial *.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Matching telephone numbers manually

It allows to associate a specific telephone number to each preset number.

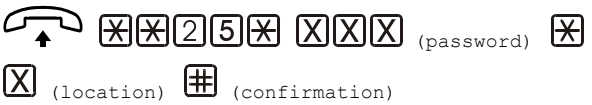
Note: in case no telephone number is manually matched to any preset number, the association is automatically carried out by auto- learning procedure.



- Lift the handset and dial: **25*.
- Enter the programming password.
- Dial *.
- Enter the position of the preset number to be matched, 1 to 5.
- Dial *.
- Enter the telephone number to be matched.
- Dial *.
- Enter again the telephone number to be matched.
- Dial # to confirm the entered parameter.
- After the confirmation tone hang up or carry on with other programmings.

Deleting a previously matched telephone number.

It allows to delete a telephone number previously matched with a preset number.



- Lift the handset and dial: **25*.
- Enter the programming password.
- Dial *.
- Enter the location of the telephone number to be deleted, 1 to 5.
- Dial # to confirm
- After the confirmation tone hang up or carry on with other programmings.

Deleting all previously-matched telephone numbers.

It allows to delete all previously-matched telephone numbers associated with preset numbers.

✳✳25✳ XXX (password) ✳ # (confirmation)

- Lift the handset and dial: **25*.
- Enter the programming password.
- Dial *.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Matching telephone numbers automatically

The auto-learning procedure allows to match automatically each preset number with the selected numbers dialed by the telephone and/or autodialer connected with GSM500.

- Enter the preset numbers after the corresponding programming codes.
- Select a telephone number to be called by the telephone or autodialer connected with the GSM500 module.

GSM500 will check if the number is already matched with a preset telephone number. If so, it will send a call to the preset number; if not, it will match the selected number to the first available preset number and will make a call to it.

In case there are not available preset numbers, but it's still possible to make associations, the selected number will be automatically matched with the first preset number.

In case all 5 possible associations have been effected, the call will be sent to the first preset number.

An SMS containing the selected number and the preset number is sent out to the administrator number (if present) upon creating any new matching.

An SMS is also sent out every time a different selection from the 5 preset ones is effected.

ADJUSTMENTS

This programming allows you to adjust the receiver gain as well as the transmitter gain.

WARNING
The factory-default settings are optimal values, please do not change them unless it is strictly necessary.

Transmission

Factory default: +6dB.

- Lift the handset and dial: **10*.
- Enter the value (1 ~ 7) according to the table below:

1	2	3	4	5	6	7
-2dB	0dB	+4dB	+6dB	+9dB	+11dB	+12dB

- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Reception

Factory default: -8dB.

- Lift the handset and dial: **11*.
- Enter the value (1 ~ 5) according to the table below:

1	2	3	4	5
-8dB	-6dB	-4dB	-2dB	0dB

- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

RELAY SETTINGS

This programming allows you to configure the relay output, available in the R2R version, either as bistable or monostable (by defining the duration of the impulse in seconds).

Factory default: monostable (1s).

Note: the relay can command loads with up to 1A to 24V absorption.

(confirm)

- Lift the handset and dial: **93*.
- Enter:

  00 bistable output replay (the relay is activated or deactivated by the code digited by the user during operation);

  01~99 monostable output relay (the relay executes an impulse of the time length preset in seconds).

- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

RESTORING DEFAULT SETTINGS

It is possible to restore the factory - default settings at any time, by dialling:

- Lift the handset and dial: **99.
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

The factory-default values are:

Telephone line voltage	52Vdc
Use mode	mode 1
Inter-digit dialling time	5s
International call prefix	00
Country calling code	39
CLIP	disabled
CLIR	depends on the provider
Roaming	enabled
Low-battery check	disabled / 4h
Power failure control	disabled
Transmitter gain	+6dB
Receiver gain	-8dB
Relay settings	monostable 1s

Note: restoring factory default does not modify the programming password and the settings entered for the "Automatic Converter" service.

RESET

You can reset the GSM500 gateway at any time, without powering it off, with the following code:

- Lift the handset and dial: **98.
- Dial # to confirm.
- Hang up.

Note: resetting the GSM500 gateway does not modify its programming profile.

PROGRAMMING VIA SMS

Programming via SMS is possible by any mobile phone or other device supporting SMS. In case the administrator number has been previously set, programming via SMS is only allowed from such telephone number. An SMS notifying that programming has been completed will be sent back by the GSM500 to the same telephone number that forwarded the programming SMS.

WARNING
Programming outgoing SMS from the Internet may not be successful if the requested format is not respected.

Message format

Each programming SMS must contain the password, allowing to access programming, and the codes corresponding to the desired settings.
The message format is required to be as follows:

ET-IG5*xxx#c..c#

Where:
ET-IG5 : programming string start
*xxx# : password string (default xxx = 0)
c..c : programming string as per table below
: separator character or end string character

Programming	Code (c..c)
Telephone line voltage	61*X
Use mode	2X
Inter-digit dialling time	8*X
International call prefix	08*X..X
Country calling code	09*X..X
CLIP activation	7*1*ggmmaa*hhmm
CLIP deactivation	7*0
CLIR permanent setting	6*X
CLIR temporary activation	16
CLIR temporary deactivation	17
Enabling roaming service	5*1
Disabling roaming service	5*0*XXXYYY
Setting telephone number for notification service	40*X…X*X…X
Deleting notification numbers	40
Setting administrator number	18*X…X*X…X
Deleting administrator number	18
Setting programming password	19*XXX*XXX
Low-battery check enabling	50
Low-battery check disabling	51
Low-battery check minimum value	52*X
Power failure control enabling	81*X
Power failure control disabling	81*0
Entering preset number	26*XXX*X*X…X*X…X
Deleting preset number	26*XXX*X
Deleting all preset numbers	26*XXX*
Reading preset numbers	26*XXX*XR
Entering selection	25*XXX*X*X…X*X…X
Deleting selection	25*XXX*X
Deleting all selections	25*XXX*
Reading selections	25*XXX*XR
Transmitter gain setting	10*X
Receiver gain setting	11*X
Relay settings	93*XX
Restoring default settings	99
Reset	98
Measuring the GSM signal level	30
Reading battery status	91
Reading relay status	92

Relay activation	92*X

For each programming refer to the relevant paragraph.

Example:
it is required to enable low-battery check and to set the telephone number for notifications.

Outgoing message text:
*ET-IG5*0#50#40*X..X*X…X#*

Notification message format

The format of the message notifying the user or the administrator who previously sent out a programming SMS, is the same as the programming message format.
SMS notifying an accepted command:

ET-IG5*xxx#c..c#

SMS notifying a rejected command:

ET-IG5*xxx#c..cERR#

Example:
outgoing SMS to enable low-battery check and to set the following incoming notification number: 3330123456.

Outgoing message text:
*ET-IG5*0#50#40*3330123456*3330123456#*

Message text notifying accepted command:
*ET-IG5*0#50#40*3330123456*3330123456#*

SERVICES

INCOMING CALLS

Allows you to answer incoming calls.
Upon receiving a phone call, the LED indicating the line status (white) will blink shortly 4 times every 4 seconds as described at chapter "SIGNALS" (see page 60) and the telephone will be ringing.

- Pick up the handset;

The LED indicating the line status (white) and the LED indicating the device status (red) will turn on and the communication with the calling party will be set up.

OUTGOING CALLS

Allows you to dial over the GSM network.
If the GSM500 gateway is connected to a PABX, please refer to the switchboard's manual.
If the GSM500 gateway is connected to a telephone:

- Pick up the handset.

The LED indicating the line status (white) will turn on and the dialling tone will be heard.

- Dial the telephone number to be called.

When the called party answers, the LED indicating the device status (red) will turn on.

Note: once you have dialled the number, you can either press # to send the number immediately, or you can wait for the call to be automatically forwarded once the inter-digit dialling time has elapsed (by default 5 seconds).

Note: in the event you receive the "no signal" tone picking up the handset, check if the signal is present and make sure the SIM card is working correctly.

MEASURING THE SIGNAL LEVEL

This procedure allows you to check the GSM signal level through your telephone.

✱✱30# (tones)

- Lift the handset.
- Dial: **30#;
- Wait for the signal reading.

The system will send a number of short tones corresponding to the signal level:

Tones	Quality
No signal	No signal
1 Tone	Low
2 Tones	Medium
3 Tones	Good
4 Tones	High

Since the signal can be subject to variations, we recommend repeating the code **30#, 2 or 3 times a few seconds apart, in order to have a reliable measurement.

Note: in case of low signal, we recommend installing the GSM500 in a different area with a better signal.

Note: if you receive the "no signal" tone, it means that the gateway has not been registered correctly by the provider. We recommend trying again after a few

moments, and in case of no result, make sure that the SIM card is working correctly.

READING THE BATTERY STATUS

If the low-battery check has been previously enabled, it is possible to check the battery status.

✱✱91# (confirm)

- Lift the handset and dial: **91#.
- After the confirmation tone hang up.

After receiving the request, GSM500 will send an SMS to the number programmed to be alerted.

The outgoing message text is the following: "*Level battery: x*", where x is the value corresponding to the minimum number of operating hours guaranteed by the battery in idle mode, according to the table at paragraph "Low-battery check".

The request will not be accepted (an error tone will be received) if the low-battery check is disabled, if the notification number to be alerted has not been previously entered or if the GSM500 is not correctly registered to the GSM network.

READING "AUTOMATIC CONVERTER" NUMBERS

It is possible to check remotely, via SMS, the preset numbers and the stored selected numbers (see chapter "Programming via SMS" for the use of SMS).

Reading preset numbers

The programming code to be contained in the message text must be the following :

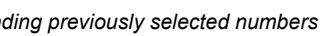
where:

XXX: programming password

X: preset number location

Reading previously selected numbers

The programming code to be contained in the message text must be the following:



dove:

XXX: programming password

X: selected number location

An answer message will be returned to user or the system administrator who sent out the SMS.

Example :
an SMS has been sent out to ascertain the preset number stored at location 1 (071123456).

Outgoing message text:
*ET-IG5*0#26*0*1R#*

Answer message text:
*ET-IG5*0#26*0*1R071123456#*

READING THE RELAY STATUS

It is possible to check remotely, via SMS, the relay status (see chapter "Programming via SMS" for the use of SMS).
The programming code to be entered in the text message must be as follows:

9 2

An answer message will be returned to user or the system administrator who sent out the SMS.

Text included in the return message if relay is OFF:
920

Text included in the return message if relay is ON:
921.

ACTIVATION RELAY

Allows you to activate or deactivate the relay available in the R2R version (see chapter "Relay settings").

- Lift the handset and dial: **92*.
- Enter:
  - 0 to deactivate the relay (bistable only);
  - 1 to activate the relay.
- Dial # to confirm.
- After the confirmation tone hang up.

SENDING SMS THROUGH DB-9

GSM500.net allows to:

- send received SMS text messages to devices wired in the DB-9 connector (in RS-232 standard);
- send SMS text messages from devices wired in the DB-9 connector (in RS-232 or CAN-bus standard).

DB-9 settings

Communication standard

It allows to define the communication standard utilized via DB-9 connector.

Default: RS-232.

- Lift the handset and dial: **12*.
- Enter:
  - 0 communication disabled;
  - 1 RS-232;
  - 3 CAN-bus.
- Dial # to confirm.
- After the confirmation tone carry on with the following programming of the communication parameters.

Note: for CAN-bus communication please refer to corresponding documentation.

Serial communication settings

It allows to set the parameters required for serial communication.

Default: 115200/8/1/none.

Note: this programming can be effectuated only after the communication standard programming.

✳✳57✳ X (bits per second)

X (data bits) X (stop bits) X (parity)

(confirm)

- Lift the handset and dial: **57*.
- Enter the parameter for the bits per second according to the table below:

parameter	RS-232	CAN-bus
1	115200	1 MB
2	57600	500 kB
3	38400	250 kB
4	19200	125 kB
5	9600	64 kB
6	4800	50 kB
7	2400	20 kB
8	1200	10 kB

- Dial 0 (data bits = 8).
- Dial 0 (stop bits = 1) or 1 (stop bits = 2).
- Dial 0 (parity = none) or 1 (parity = even) or 2 (parity = odd).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Sending received SMS text messages through DB-9 connector

This parameter allows to forward text messages received by GSM500.net to devices wired in the DB-9 connector (in RS-232 standard).
The format of incoming text messages is required to be as follows:

&XXXXy…y

Where:

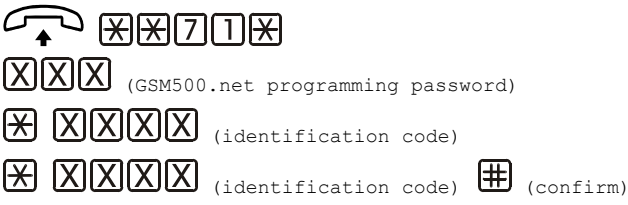
&	: string start
XXXX	: identification code (alphanumeric)
y..y	: text forwarded through DB-9 connector.

An SMS notifying that the message has been delivered will be sent back by the GSM500.net to the same telephone number that forwarded the SMS with the identification code.
The notification message is:

OK#

Note: text messages (SMS) with more than 160 digits are divided by the operator in many text messages (SMS); the GSM500.net sends a notification per each text message received.

Note: identification codes containing letters can be programmed only via SMS.

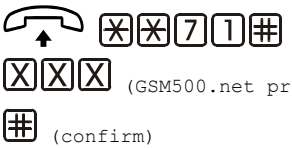


- Lift the handset and dial: **71*.

- Enter the GSM500.net programming password (default XXX = 0).
- Dial *.
- Enter the identification code (4 digits).
- Dial *.
- Enter the identification code (for confirmation).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Deleting

It allows to disable forwarding the incoming text messages through the DB-9.



- Lift the handset and dial: **71#.
- Enter the GSM500.net programming password (default XXX = 0).
- Dial # to confirm.
- After the confirmation tone hang up or carry on with other programmings.

Sending SMS from device wired in the DB-9 connector

It allows external devices wired in the DB-9 connector (in RS-232 or CAN-bus standard) to send SMS text messages.
The text format transmitted by the external device to the GSM500.net, through the DB-9 connector, is required to be as follows:

SMSx…x:y…y<CTRL+Z>

Where:

SMS	: string start
x…x	: telephone number on which the SMS must be sent
y...y	: message text to be sent (max. 160 characters)
<CTRL+Z>	: non-editable character defining end of text.

The SMS can be sent on a GSM500.net preset number (see "Setting telephone number for notification service"). In this case, the text format is required to be as follow:

SMS:y…y<CTRL+Z>

Note: to send SMS, the GSM500.net must be correctly registered to the GSM network and the SIM card must be topped up. Moreover, the GSM500.net must not be engaged with an ongoing voice call by the time the message text is received from the external device.

Note: the GSM500.net does not send the external device any notification of failed/successful SMS delivery. The GSM500.net is capable of notifying the external device an SMS feedback received by the remote recipient (see "Sending received SMS text messages through DB-9 connector").

DATA TRANSMISSION

The **COMNet** system allows users to connect remotely with devices equipped with RS232/RS485/CAN BUS, replacing traditional serial communication which is commonly performed locally (i.e. between peripherals and custom boards – Fig. A – or between a PC-based proprietary application and a lift controller board – Fig. B –).

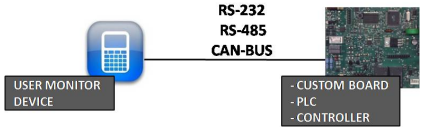


Figure A: example of local serial communication

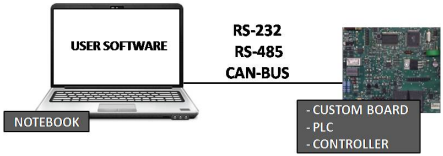


Figure B: example of local serial communication

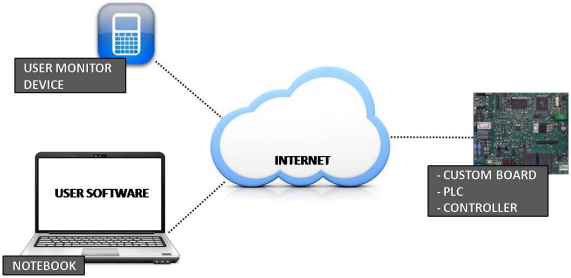


Figure C: general example of remote serial communication

Setting up a **COMNet** system requires:
- connecting a **GSM500.net** gateway (properly programmed) to the serial port of the remote device to be controlled; the GSM SIM card to be inserted into the GSM500.net gateway must be enabled for voice and data traffic (UMTS SIM cards are not compatible);
- installing the **COMNet PC Client** software in the PC which will be used for remote-monitoring; the PC must be able to access the Internet.

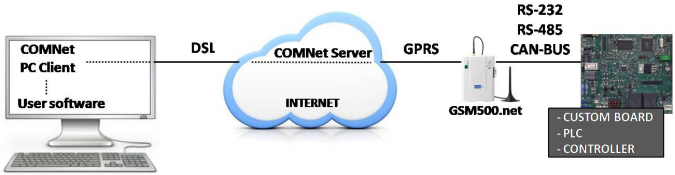


Figure D: example of COMNet system

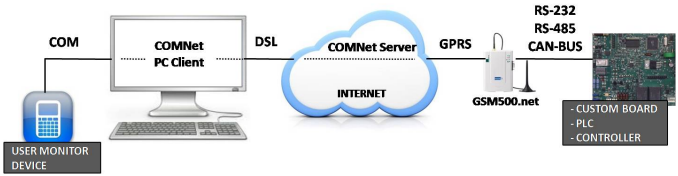


Figure E: example of COMNet system

The **COMNet** system exclusively allows to set up a remote two-way data communication. The data flow coming out of the remote device will be sent to the same application commonly used for local wired communication or to the a physical COM port of the computer.

The connection procedure simply requires to enter the SIM card telephone number associated with the remote GSM500.net into the COMNet PC Client. This eliminates any difficulties in locating remote devices not assigned to static IP addresses.

The data connection is established by the system on demand and the data are transferred via GPRS over an Esse-ti proprietary server (**COMNet Server**).

The GSM500.net connected to the remote device to be monitored, may also be used as a standard GSM gateway for voice transmission, by means of the dedicated plug or connector (i.e. it can be connected with the elevator emergency phone dialer) and the same SIM card needed for remote monitoring. Due to the characteristics of the GPRS network, the voice call is always privileged over the data transmission, therefore in case of a voice emergency call, the ongoing data connection will be automatically cut off.

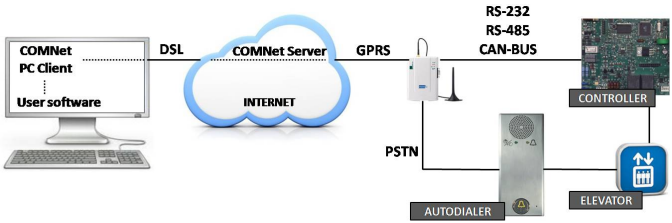
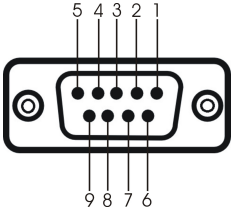


Figure F: example of COMNet system with GSM500.net used as gateway for voice transmission

Please see the user manual of the COMNet for the data transmission programming of the GSM500.net and for the installation and use of the COMNet PC client software..

FEMALE DB-9 CONNECTOR



RS-232

TX	PIN2
RX	PIN3
GND	PIN5

RS-485

TXD-	PIN6
TXD+	PIN7
GND	PIN5

CAN-bus

CANH	PIN8
CANL	PIN9
GND	PIN5

SIGNALS

TONES

Dialling

It indicates that the GSM500 is ready for dialing.

Dissuasion

It indicates: delay in dialing, end of conversation, access to services not permitted.

Busy

It indicates that the called party is busy.

Confirmation

It indicates that the requested service or programming has been accepted.

Error

It indicates that the requested programming has not been accepted.

GSM signal level

Low signal level.

Medium signal level.

Good signal level.

High signal level.

No signal.

CALL SIGNALS

It indicates an incoming call.

LED

GSM signal indicator LED (GREEN)

No signal.

Low signal level.

Medium signal level.

Good signal level.

High signal level.

Status indicator LED (RED)

Upon switch on, it indicates GSM network login in progress; if it keeps blinking, it may indicate that the GSM500 has not been correctly registered with the network, the SIM card is protected by the PIN code or other problems.

It indicates the GSM500 is correctly registered to the network.

It indicates voice connection in progress.

Line status indicator LED / Data transmission indicator LED (WHITE)

It indicates that the line is in use.

It indicates that the line is not in use.

It indicates an incoming call.

Data transmission

During a data connection the LED blinks in a variable mode.

Power supply status indicator LED (BLUE)

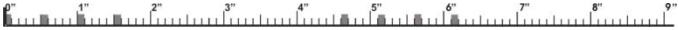
It indicates that the power supply is connected and the battery has max capacity charge.

It indicates that the power supply is connected and the battery has good capacity charge.

It indicates that the power supply is connected and the battery has medium capacity charge.

It indicates that the power supply is connected and the battery has low capacity charge.

It indicates that the power supply is connected and the battery is either disconnected or dead.



It indicates that the power supply is disconnected and the battery guarantees more than 7-hour operation in idle state.

It indicates that the power supply is disconnected and the battery guarantees up to 7-hour operation in idle state.

It indicates that the power supply is disconnected and the battery guarantees 2-hour operation in idle state.

It indicates that the power supply is disconnected and the battery guarantees 1-hour operation in idle state.

PROBLEM-DETECTION GUIDE

This section shows a list of solutions to the most commonly encountered problems.

Detected problem	Root cause	Solution
All LEDs are unlit	GSM500 not supplied	Check power supply
The red LED blinks quickly	SIM card not present or not correctly inserted	Correctly insert the SIM card in the dedicated location
	SIM card locked by PIN code	Disable the PIN code through your mobile phone
	SIM card expired or damaged	Check the SIM card operation on your mobile phone
	SIM card not supported (e.g. UMTS)	Use a GSM SIM card
		Make a test with a SIM card from a different GSM provider
	Unconnected antenna or damaged connection cable	Check the antenna connection and the correct operation of the cable
	GSM signal absence	Check the signal strength by your mobile phone
	Insufficient power supply	Check the power supply
	Generic SW problem	Switch off and back on GSM500
The red LED blinks slowly, but the green LED is unlit	GSM signal level is too low to allow outgoing calls	Move the GSM500 and the antenna into a better position
The autodialer connected to GSM500 does not detect the telephone line	Telephone line voltage on TEL terminal and on RJ-11 plug is insufficient	Increase the voltage by following the instructions at paragraph "Telephone line voltage"
The autodialer connected to GSM500 does not succeed in forwarding a call	The autodialer performs a tone detection over the telephone line	Set use mode 2 (or 4) by following the programming instructions at paragraph "Use Mode"

During conversation echo is heard	-	Increase protection on echo-related occurrences by setting use mode 3 (or 4) by following the programming instructions at paragraph "Use Mode"

GSM500

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